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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/618,062	07/11/2003	John R. Stowell	PD-02W150	4327
23915	7590	01/12/2006	EXAMINER	
PATENT DOCKET ADMINISTRATION RAYTHEON SYSTEMS COMPANY P.O. BOX 902 (E1/E150) BLDG E1 M S E150 EL SEGUNDO, CA 90245-0902			PARRIES, DRU M	
			ART UNIT	PAPER NUMBER
			2836	

DATE MAILED: 01/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/618,062

Applicant(s)

STOWELL ET AL.

Examiner

Dru M. Parries

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 11 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6, 9-11, 14-17 and 19-22 is/are rejected.
- 7) ☒ Claim(s) 7, 8, 12, 13, 18 and 23 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3-23-05.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Regarding the phrase “depending on the control signal”, the Examiner is not sure if this means that sometimes the combined signal has a duty cycle greater than the switching signal. A detailed explanation would be much appreciated.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-6, 11, 14-17, and 20-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Jiang (EP 0907237). Jiang teaches a power converter with a shared first-side stage (54) to receive an input (Vin). He also teaches a plurality of second-side converter stages (56&60, 58&62, etc.), which split the current flowing from the first-side stage, to generate an output (Vo1, Vo2, etc.). He goes on to teach control circuitry (i.e. signal generator, driver circuits) for monitoring the outputs, and controlling the switches to regulate the output voltage (Col. 2, lines 49-58; Col. 3, lines 1-10). Jiang teaches the second-side converter stages comprising a

transformer (TP & TS) and a set of switching elements (S<sub>22&23</sub>, S<sub>24&25</sub>) that are alternatively switched on and off to regulate the output. Jiang teaches the first-side stage switches having a duty cycle of 50% and the second-side stage switches are each PWM within the 50% duty cycle of the first-side switches. Jiang teaches the first-side stage comprising first and second switching elements (S<sub>20&S21</sub>), a first second-side stage comprising third and fourth switches (S<sub>22&S23</sub>), and a second second-side stage comprising fifth and sixth switches (S<sub>24&S25</sub>), all which are alternatively switched on and off via PWM controller. The first, third, and fifth switching elements are switched on at substantially the same time, and the third and fifth switches will be switched off before the first (Fig. 3). Jiang also teaches the use of freewheeling diodes (Col. 3, lines 16-21).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jiang (EP 0907237). Jiang teaches a power converter as described above. Jiang doesn't explicitly teach the converter being a boost or buck converter. The Examiner takes Official notice that there are such elements as buck and/or boost converters. It would have been obvious to one of ordinary skill in the art at the time of the invention to use Jiang's converter as a buck or boost converter, so that systems when a lower voltage is needed can use this invention, and same as if when a higher voltage is needed.

7. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jiang (EP 0907237) as applied to claims 11,16, and 17 above, and further in view of Harding et al. (2002/0037796). Jiang teaches a converter as described above. Jiang fails to explicitly teach an optical coupler to isolate the control circuitry from the driver circuitry. Harding teaches an optical coupler to isolate the control circuitry from any device external to the controller ([0025], lines 3-5). It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate an optical coupler into Jiang's invention to isolate the controller from driver circuitry and excess noise.

#### ***Allowable Subject Matter***

8. Claims 7-8, 12-13, 18 and 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. These claims would be allowable because no prior art of record teaches the specific configuration of claim 5, and the method of operating the switches as claimed in 6. Also, no prior art of record teaches a device (i.e. steering diodes) for preventing current from flowing between low-side stages (specific configuration) when the switching elements of one of the stages have been turned off.

#### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dru M. Parries whose telephone number is (571) 272-8542. The

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examiner can normally be reached on Monday -Thursday from 8:00am to 5:00pm. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus, can be reached on 571-272-2800 x 36. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DMP

1-4-2006



BRIAN SIRCUS  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800